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Sleeping with the Enemy: Dichotomies and Polarisation in Indian Policy Debates on the Environmental and Social Effects of Irrigation

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Abstract

Large-scale, government-managed canal irrigation represents the technocratic approach to water development. Large-scale irrigation faces many problems but they have been relegated to the periphery in the water debate generally and about large dams in particular. It has given rise to dichotomous thinking and polarised politics. This paper explores these issues in case of large canal irrigation in India. The debates imply implication for institutions, science and technology and developmental practices which need to be viewed within the domain of new approach.

1. Introduction

Large-scale, government-managed canal irrigation usually figures as the enemy in the dichotomous world of environmentalists. It represents the technocratic approach to development and is seen as oblivious to local needs and knowledge. It is the abode of the Green Revolution, inhabited by privileged, market-oriented, large farmers who degrade the land with excessive applications of fertiliser and pesticides, create widespread water logging and salinisation through over-irrigation, and compete with small, marginal farmers and even push them off their rain-fed fields. Canal irrigation has produced a rural elite who wield a lot of political power to the detriment of non-landowning food buyers, particularly urban consumers, by keeping food prices artificially high.

The image of canal irrigation as one malignant influence on ecological and human development has been strengthened by the debate on large dams as it has evolved in India. In fact, the debate on the negative ecological and social effects of large dams has over-shadowed the discussion on what happens inside existing large-scale canal irrigation systems, where dam-damage has already been done. There is extensive public and academic debate on the ecological and social effects of submergence and on the displacement and rehabilitation issues related to dam building but very little on the water logging, salinisation and other environmental hazards caused by existing canal systems.[1] As an intended or unintended consequence of the debate on large dams, discussion about the operational problems of canal irrigation has been pushed into the background, critical research attention has been shifted elsewhere,[2] and the irrigation establishment has become extremely defensive towards the raising of issues by 'outsiders'.[3] The environmental concern movement has been very influential in reshaping the water resource management debate,[4] but, at the same time, the way the interaction with the water resource establishment has taken place has paralysed the sector. Progress in water sector reform in India has been very limited.

This paper does not explore the details of the environmental and social problems related to canal irrigation or the intricacies of the counterpoint, its contribution to national food security and other developmental benefits.[5] It addresses a different issue: it is my contention that there is a deadlock in the sector as a result of dichotomous thinking and polarised politics. This deadlock exists on the environmental front as well as on the management and human development fronts and in terms of analysis and thinking as well as new policy initiatives. The paper suggests that this problem is not exclusive to canal irrigation, though it has taken an extreme form in this sector. Dichotomisation and polarisation also apply to debates and interventions regarding water resource management in general.

The question raised in this paper is why dichotomous thinking and polarised politics prevails in relation to canal irrigation and to water resource management in general. The answer is that this worldview reflects two characteristics of India:

1) A lack of institutions in the polity where development approaches and priorities can be negotiated by interest groups, and
2) The existence of a water resource science that has insufficient linkages with real-world water problems.

The paper attempts to provide a critique, in the Marxist sense of the term, of the present water resource management discourse and practice. It tries to show how that discourse and practice reflect particular features of the society in which they exist, and how they fail to overcome the limitations caused by that embeddedness.

At the normative, policy level the paper argues that both institutional and technological innovation need, to be democratised by adopting a framework of negotiated development. This involves the creation of institutions in which different interest groups can meet, interact, and negotiate the technical and social transformation of the water resource management system. It is argued that such multi-stakeholder institutions are conspicuous in their absence from the Indian polity. That polity is characterised by a 'winner takes all' approach that operates in a social structure with very few vertical solidarities. There is also a large institutional gap between the centralised state bureaucracy and local (basically village)-level decision-making bodies. Apart from institutions, the process of negotiated development requires a water resource science that engages with real-world water problems in a comprehensive manner. Such a science is largely absent at present. It is suggested that the emerging international and national bandwagon of integrated water resource management (IWRM) may provide a vehicle for introducing new technical and institutional approaches in the water resource sector on a larger scale than the experimental and local scale at which they now exist.

My argument to support these statements is laid out as follows. In the following section, I substantiate the claim that dichotomous thinking and polarised politics prevail in the water resource sector. Then, I continue to discuss a number of encouraging initiatives and processes which aim at negotiated development by multiple interest groups. In the next section, I summarise the critique of the present water resources discourse and practice that follows from the two preceding sections. Lastly, I outline some implications of the argument for research and praxis. For those unfamiliar with canal irrigation, I have included Box 1 as a short introduction to the field.

Box 1: The problems with canal irrigation

Irrigation systems can be classified in different ways. One way is based mainly on differences in irrigation technology and distinguishes among canal, tank and lift irrigation. Administrative classification in contrast identities, major, medium and minor irrigation, which is based on the size of systems' command area (>10,000 ha, 2000-10,000 ha, and <2000 ha respectively). Yet another typology separates government or agency-managed systems, farmer-managed systems, and privately managed systems. 'Canal irrigation' as a term is generally used to refer to large-scale, government-managed surface irrigation systems, and in practice, is thus a composite category. In many cases they are reservoir-fed systems.

Huge sums of money have been invested in the expansion of canal irrigation since independence, it was, in fact, at the heart of the Nehruvian development model. The problems managing these systems were recognised as early as the mid-1960s, but acquired policy prominence in the 1970s as part of an emerging international water management debate (see Chambers (1988) for an overview). This debate focussed on the reasons for poor performance and inequitable water distribution. Taking its cue from institutional transformation processes in the Philippines towards more farmer control in irrigation management, it introduced the notion of 'participation'. This management debate has recently raised the question of the institutional reform of the irrigation bureaucracy. The main environmental issue in canal irrigation is water logging and salinisation. It is hard to get reliable data on the extent of this problem, but it is a serious problem, particularly in flat, alluvial regions. Other environmental issues are health and water quality issues, but these have received much less attention. Though these environmental problems partly come with the nature of the technology and its design principles, they are mostly 'second order' problems in the sense that they derive from poor management.

In the same period, but largely independent of this 'internal' debate on canal irrigation, environmental and social concerns started to be raised about the building of large dams whether for hydropower or irrigation. The displacement and ecological destruction related to submergence and the problems related to resettlement and rehabilitation are the central issues. This concern has developed into an overall critique of the development paradigm that large-scale water infrastructure development is seen to represent. That paradigm has been described as being a top-down and technocratic, and as advocating resource-intensive, market-oriented agricultural development without given attention to the livelihoods of the poor or marginalised or to ecological sustainability.

The following are some of the fundamental development issues integral to canal irrigation/large-scale water infrastructure development.

1) The inclusion, exclusion or displacement of people by virtue of delineating command areas and choosing dam sites. This raises broader questions about a) canal irrigation as part of overall water resource management in a region, b) allocation and (water) rights, and c) technical options and alternatives to centralised water control.
2) The next is the rationing problem. Many of India's canal systems have been designed to spread water thinly over many villages and farmers. Water is scarce by design. In practice, water is often appropriated by a certain segment of the farming community, leaving others deprived. (In) equity in access to water resources is intimately linked to the type, size and distribution of agricultural production and employment and on the occurrence of water logging and salinisation.
3) Lack of internalisation by the irrigation bureaucracy of environmental concerns and other new demands on the sector, like increasing overall water scarcity and transparency and accountability in management. Institutional rigidity in the irrigation sector is substantial, and efforts to reform irrigation and water agencies are in the very early stages.
4) Issues of productivity (yield gap, water use efficiency) and financial sustainability of the sector. These relate to broader issues of agricultural pricing, technological innovation, and government budgets and subsidies.

In short, the environmental issues related to canal irrigation have to be seen from a broad perspective.

2. Dichotomies and Polarisation in Water Resource Management

This is the bad news section of the paper. It discusses a number of examples and issues that show the prevalence of dichotomous thinking and polarised politics in the water resource sector.

a) In canal irrigation there are only rich people

While writing the first draft of this paper I discussed water management issues with staff from an NGO working on watershed development, training SC/ST, electing women and minorities to panchayat raj institutions, and other matters. The staff stated, 'We feel that in canal irrigation we mainly find more privileged people'. This very common statement and perception is one of the reasons why very few NGOs are active in the canal irrigation sector.[6] There is of course, truth in this view.

Canal irrigation systems have been core Green Revolution areas[7] and have supported the emergence of politically vocal and influential farmers' movements (Brass, 1995) that are, in Bardhan's view, part of the triangle of dominant elites who control the Indian political economy: industrialists, state officials and large farmers (Bardhan, 1984).

This perception can however, be questioned. At the empirical level, it can be argued that in canal systems substantial areas are deprived of water.[8] In terms of livelihoods and poverty, villages in these deprived areas cannot be distinguished from those outside the formally designated command area. A second empirical point is that canal irrigation systems, comprise not only farmers but also many landless and near-landless labourers, some of whom are seasonal migrants from non-irrigated areas. The distribution pattern of water, water use efficiency, productivity and quality of management influence the employment generated in irrigated agriculture (see Chambers, 1994). The visibility of large farmers in canal irrigation systems should not hide from the observer's view the social differentiation extant in these systems.

At the strategic level, what is often implicit in the 'canal-irrigation-is-for-the privileged' perception is that those who want to work for the benefit of poor and marginalised groups should work with these groups directly and preferably with the 'poorest of the poor.' There can be no objection to this commitment in general, but it is an empirical question where the leverage points for enhancing the human development of the poor and marginalised are located.

But even if it is an individual's choice is to work with and from the perspective of the 'more deprived' in non-irrigated areas, canal irrigation cannot be ignored. The above reference to seasonal labour reveals that canal irrigation systems, though often perceived as isolated systems, actually have many connections with their environment. These connections are physical through the hydrological cycle and the—acknowledged or unacknowledged—multiple uses of the systems (for example, their relevance for drinking water supply and groundwater recharge). Social, political and economic connections also exist. Examples are how canal irrigation shapes class relations, how it shapes regional politics, and what the forward and backward economic linkages and multiplier effects of irrigated agriculture are.

The gist of this discussion is that compartmentalised views of (canal) irrigated vs. rain-fed agriculture, operating through homogenised characterisations like 'for the rich' and 'for the poor,' cannot stand the empirical test and must, therefore, be reconsidered.

b) The debate on large dams

The history of and the positions taken by social movements, which oppose the building of large dams have been documented elsewhere in detail, and will not be discussed here (see, for example, Dhawan, 1990 and Singh, 1997). I limit myself to a few observations on the political deadlock that this debate seems to have reached.

The political terrain is now occupied by two parties that are both absolutely convinced of their cases. On one side there is the anti-dam movement, which considers the dam to be a form of state terror and ecological destruction. On the other side is an aggressive pro-dam lobby that sees dams as the only possibility for agricultural and overall economic development. The anti-dam movement blames the government and engineers-contractors lobby for being technocratic, callous and self-centred. At the same time these engineers blame NGOs and the social anti-dam movement for holding unrealistic ideas about small-scale development options. 'Small is beautiful' opposes 'big is beautiful'.[9]

It's not that there are no nuanced views available. In fact, elaborate proposals for alternative approaches to water resource and dam development are plenty. An example is a publication on how to redesign the Sardar Sarovar project (Paranjape and Joy, 1995). But such proposals have never caught the imagination of either the dam establishment or the community of social activists. Or, to assess the situation more positively there was never any possibility of getting such compromise approaches discussed and considered seriously at levels where they could shape mainstream policy.

The observation I want to make is that the conflict of views and interests regarding the building of large dams has not led to any institutional transformation in water resource planning and development. The conflicts have not been 'internalised' and no process of 'social learning' has taken place. For a country that takes pride in being the largest democracy in the world this is somewhat paradoxical.[10]

That this is not a natural course of events can be shown using several examples. The success of environmental movements in other parts of the world lies exactly in the fact that 'internalisation' and 'social learning' did take place and that there is now a mainstream project of 'ecological modernisation,' particularly in the industrial sector.[11] Some of these examples are found in the water sector. I briefly discuss two of them.

The first is about the Netherlands. In 1953, after the south-western part of the country was flooded in a February storm that coincided with high tides, and 2000 people and a lot of cattle lost their lives, the Dutch government designed the Delta Plan. This was a plan to close the estuaries and other river outlets by constructing high dikes. It shortened the coastline drastically and protected the land from the influx of seawater. In the 1970s, when the closing of the biggest estuary was being planned and prepared for, environmental concerns started being voiced. The closure, it was argued would permanently destroy a unique eco-system. A political debate followed, in which the safety and economic value of the land was pitted against the ecological, recreational and economic value of the water. After extended agitation and debate, a compromise was reached: a dam that would let the tide in during normal weather conditions but could be closed when there was a storm, was designed. The considerable amount of technical innovation that the civil engineers—who were at first absolutely in favour of permanent and full closure—had to introduce in order to be able to build this barrier, is now an integral part of their professional ethos. Every foreign visitor is taken to see this impressive piece of human ingenuity. Following a political and social conflict the environmental concern was internalised into a new technological design. This conflict was played out in parliament, but also through an endless number of studies, reports, hearings and meetings of the different interest groups.

The second example is from the USA and taken from Espeland (1998). In the early 1980s the Yavapai Indians in the American Southwest opposed the building of the Orme Dam by the USBR (the United States Bureau of Reclamation) because it would submerge a large part of their reservation. Legislation accepted under the Carter administration had made an environmental impact assessment (EIA) part of the project process. This tool was used to attempt to measure, compare and weigh the different interests and preferences related to the dam and to resource use. The Yavapai Indians won the argument, though they thought it was for the wrong reasons. In their view, the commensuration of all interests and preferences in one framework (using the neo-institutional economic theory of values, preferences and choice making) denied the different rationality with which they interacted with the natural environment. What is interesting in the context of the present discussion is that the use of the EIA tool and its political importance as a conflict mediator, led to the emergence of a new professional group, 'a new guard' of environmental assessment specialists, in addition to the 'old

guard' of civil engineers and hydrologists who had earlier dominated the USBR. As in the Netherlands, the environmental concerns were indeed internalised though not everyone may have been altogether happy with the methodologies adopted.

To avoid the impression that the process of internalisation is unique to rich, industrialised countries, where working systems for mandatory public consultation may exist, I report briefly the results of an inventory of the existence of 'multi-stakeholder platforms in water resource management' in three parts of the world: South America, Southern Africa and Asia. Using secondary literature, this study documents the emergence and functioning of institutions at the sub-basin and basin levels that have some degree of discussion, and planning of and decision-making on water resource management by different interest groups (different types of water users, like farmers, industries and urban domestic users; different government agencies; and eventual other parties).[12] These institutions would thus be located somewhere between micro-level local water management institutions and macro-level international committees for mediating cross-boundary water conflicts.

The study concluded that in South America such institutions are relatively prevalent, and either are initiated by governments or emerge as an outcome of social and political conflicts over water. In Southern Africa, a number of countries are establishing catchment councils, which have stakeholder representation, for water resource planning. In Asia, in contrast we found virtually no multi-stakeholders institutions. In India we could identify very few. The main ones are the initiative in the Sabarmati Basin to form a stakeholders' forum and the evolution of a dam-oustees movement in the Krishna Basin in Maharashtra (see below).

Apart from these few examples, the terrain of water resource management seems to be divided into local management systems on the one hand, and centralised, bureaucratic, top-down management systems on the other. Systems are either 'government' or 'village' with no institutional middle-ground with institutional mechanisms to negotiate water resource management and use at the basin or sub-basin level, or if one wishes to follow administrative lines, at the mandal, taluk or district levels. This is yet another paradox in an otherwise democratic set-up.[13]

The glorification of the community and the village

Another prevalent dichotomy in water resource discussions is that between past and present. The past tends to be portrayed as glorious, the present as problematic. This resonates strongly with the dichotomy between: traditional and modern, which features strongly in debates over tank irrigation.

Literature on tank irrigations abounds with assertions like the following:

> "Irrigation Tank is one of the best innovations in gravity irrigation systems in the world. It is an appropriate water harvesting structure in villages to preserve village eco-system, and it has got [sic] well integrated with rural culture. (...) Traditionally tanks were considered as village assets and were revered by the rural community. Basically Indian civilisation placed a great value on decentralisation of resources and political power which automatically set a limit to [sic] the size of the irrigation structure. Large-scale systems such as modern reservoirs would not have been compatible with the values and goals of the ancient Indian civilisation. The traditional irrigation technology is also ecologically sound." (Vasimalai and Shanmugam,1993).
>
> "Our experience in organising farmers reinforces our conviction that farmers have the capability to organise themselves and to mobilise technical, financial and managerial resources to manage irrigation systems. It has been possible to replicate farmers' organisations in neighbouring areas. The degree of their efficiency and sustainability is directly related to how effectively the farmers

> have been motivated and inspired and how their organisations have been supported and fostered to blossom into self-reliant groups." (Ibid)

This perception that tank irrigation had a wonderful past is particularly strong among those who promote intervention programmes for tank rehabilitation. The physical rehabilitation of a tank (desiltation, repair of bunds, reduction of encroachment, catchment management) runs mentally parallel to institutional rehabilitation, which involves rejuvenating or reviving the traditional institutions of tank management.

Incisive criticism of such views can be found in Mosse's work on South Indian tanks (see, for example, Mosse, 1999, 2003; also see Shah, 2003). Some points relevant to the present discussion follow. Glorification of the past is unwarranted because effective tank management was often rooted in oppressive social relations, including coerced labour. In fact, some of the present conflicts over tanks are a result of the gradual emancipation of previously oppressed groups. Furthermore, in every historical period there is evidence of tanks in decline; there never was a 'golden age'. Lastly, the socio-economic and technological context of tank use has changed to so much that the issue is more properly seen as the reinvention of tanks rather than their resurrection or revival. The vocabulary of tradition depoliticises the discussion surrounding tanks.

Positing farmer-managed irrigation systems like tank systems as the logical or easy alternative to government-managed irrigation, notably canal irrigation, is a (gross) simplification. Each type of irrigation and, more broadly, each type of land and water resource management has its own problems.[14]

In canal irrigation too, a black-and-white worldview plays a role in discussions about the devolution of management responsibilities to the local level. The box used is that of 'the farmers' who, because they are seen as a homogenous category can readily form a 'water users association' as a collectivity in which joint, consensus-oriented decision-making is possible.

c) The dominance of water supply enhancement

There is a problematic similarity in approach between the antagonists involved in the village versus government dichotomy. Common to the approaches to water resource management of both NGOs/CSOs and government agencies is their focus on water supply enhancement.

An 'increase in supply' approach, which hopes to find extra water to solve problems and constraints, is very evident in the focus of government agencies' on dam building and infrastructure creation. As an aside it should be mentioned that this approach is strongly supported by how politicians operate. Politicians prefer to solve problems by bringing in new or extra water to a region rather than by addressing the more complicated issues of allocation and water use efficiency.

The supply enhancement focus is perhaps less easily recognised in the watershed development and water conservation programmes that NGOs/CSOs in the water sector favour but it is still there. Building check dams to enhance groundwater recharge, well-recharge techniques, and other technologies for water in-situ conservation are, at heart, strategies to make more water available in a particular area. Supply-side approaches tend not to address the following two issues:

1) The downstream effects of upstream conservation. When more water is conserved and used in upstream areas, downstream users may be deprived of what they feel are

their historical rights. As long as watershed development and water conservation are done on a relatively small scale, the issue will not come to the fore very strongly. However, when such programmes expand to larger areas, the issues of allocations and rights across a basin become unavoidable. The micro approach of most watershed and water conservation initiatives seems ill-equipped to deal with the inevitable controversy.

2) The ongoing intensification of water use. When extra water becomes available in a given area, water use usually intensifies. The main reasons are the intensification and expansion of agricultural production and population growth. The question of what should happen after the extra water made available has been 'used up' is often not addressed. One reason it is ignored may be the implicit or explicit focus of watershed development and water conservation programmes on subsistence-oriented survival strategies and their tendency to equate ecological sustainability with 'no growth' local economies. Whether these are realistic assumptions is questionable (see below).

The gist of this discussion is that the issue of allocation, water rights and demand management at the regional level are insufficiently recognised in present debates on and approaches to water resource management. Ironically, the antagonists in that polarised debate have comparable blind spots in this regard.[15]

d)

e) Crumbling Tribunals

The allocation of the water which flows in Indian rivers is made through the Inter-State Water Disputes Tribunals. These Tribunals were established to allocate the waters of inter-State rivers to the respective States and to individual projects within those States. This system has worked well till recently, but now seems to be under severe pressure, as is suggested by the inability of the States of Karnataka and Tamil Nadu to settle the disputes regarding the Cauvery River in South India. The revision of the Cauvery agreement has led to a lot of political turmoil both between and within the two states. At present, the conflict is being mediated in a political council of chief ministers chaired by India's Prime Minister.[16]

What this case suggests is that in basins that are 'closing' (that is, where all water is committed and zero-sum games appear in allocation) the system of Tribunals is less than adequate to deal with the tensions and conflicts generated. The system can determine allocation for a long period by using a certain dependable supply as the standard, but it does not have any mechanisms for addressing short-term and medium-term operational issues (like the timing of supplies in a given year, handling conflicting demands at a given moment, and mitigating short-and medium-term scarcities). There are also no provisions for addressing water quality issues. Conflicts over all these issues will increase with increasing overall scarcity. The point is that the problems centred around the Tribunals illustrate the existence of an institutional gap in operational management at the basin and sub-basin levels and the fact that tensions and conflicts at these levels are on the increase.

f) The switch to abstract and high-tech water science

For those interested in the history of water engineering there has been an interesting shift in the post World War II and post-Independence period. One result of America's dominance and the decolonisation process after the Second World War has been the adoption of the American irrigation engineering approach by many countries. In the late 1940s and early 1950s many study trips were made to the USA to see the 'modern' irrigation systems developed there in the

first half of the century. This is true for the institute where this author studied and worked for a long time, Wageningen University in the Netherlands, of the Philippines which literally almost copied the USBR manuals; and also for India. India used not only the USA but also the USSR and Eastern Europe as a reference for large-scale irrigation development.

Colonial powers had developed 'indigenous' imperial irrigation engineering traditions in their respective colonies (the British in India and Egypt, the French in North Africa and Vietnam, the Dutch in Indonesia). These were, to a large extent, distinct and regionally specific, as the types of irrigation and the contexts were different.[17]

One of the most striking features of engineering debates held in the first half of the 20th century in India is the orientation of the discussions towards field-level problems. The sedimentation problem in the canals in the north was a much researched and discussed as a very practical managerial issue. There was extensive experimentation with different types of division structures which are the devices at the interface of government managers and farmer irrigators and whose type expresses as well as shapes the relation between these two (see Bolding, Mollinga and van Straaten (1995) for a more detailed account). Management issues translated into scientific discussion among engineers (who were British as well as Indian).

After Independence two things happened. The first was the orientation towards the abstract 'universal' science of hydrology, hydraulics and civil engineering as developed and practiced in the USA (and the USSR). The second was a shift in orientation towards 'high-tech' engineering, notably the design of dams and large canals. The following anecdote illustrates these shifts. The last publication on the mundane artefact of the canal irrigation division structure from the Karnataka Engineering Research Station which I have been able to trace, was 1966. In the early 1990s its hydraulics research programme focused on topics like spillway designs for large dams. Though this author is unable to fully explain this transformation, the resonance of the universal science with the Nehruvian development model must have been an important factor.

This is not to say that the 'indigenous' tradition disappeared. It is still taught and used. But it has lost its central place and professional legitimacy, and it has stagnated. The vibrancy of the period from the 1920s to the 1940s is now absent. The worst part of this decline is that the orientation of irrigation engineering science towards field level operational issues has largely been lost.

The general point is that the opposition of 'modern Western science' and 'local knowledge' that can be found in a lot of critical discourse on water resources issues is based on an inadequate statement of the knowledge issue. This is not only because of the tendency to essentialise the two categories and, consequently, to glorify or demonise them.[18] I suggest that the central issue, at least as far as canal irrigation is concerned, is the arrested development and potential transformation of 'indigenous' colonial science after Independence. This science was 'modern' in many respects, but 'local' in others. One of its strengths was that it was much more 'real world'-oriented than the present vanguard of engineering and hydrological science.

3. Towards Negotiated Water Resource Development

This is the good news section of this paper. It briefly discusses some encouraging developments in the water resource domain. I begin with the practical examples already referred to above: the Sabarmati Forum in Gujarat, and the dam-oustees movement in Maharashtra. After this I discuss the relevance of the Panchayat Raj institutions to the discussion at hand.

g) The Sabarmati Basin stakeholder platform[19]

The Sabarmati River Basin stakeholder forum is a case of a civil society initiative to facilitate the emergence of a multi-stakeholder platform for integrated river basin management. The account below covers the period from 1997 to 2001. The initiative was an outcome of the involvement on the NGO VIKSAT (Vikaram Sarabhai Center for Development Interaction, Ahmedabad) in three different projects in the Sabarmati River basin.

These projects were:

1) Water Scarcity and Pollution Problems in Sabarmati River Basin: A Participatory Approach to Water Management in the Basin supported by the Gujarat Ecology Commission under the World Bank's COMNEAF;
2) Local Supply vs. End-use Conservation Management with support from the International Development Research Center (IDRC), Canada;
3) A pilot project in the Sabarmati River Basin in India run with Indo-French collaboration.

The overall goal of these three projects was to facilitate the emergence of one or more forums of stakeholders, which would enable them to participate in the planning and implementation of water management interventions to address water scarcity and population problems in the Sabarmati River Basin.

The specific objectives of the exercise included the following:

1) To understand the nature and extent of the water scarcity and pollution problems in Sabarmati River Basin and their impact on different stakeholders;
2) To identify technically, socially and economically viable water management interventions (physical and regulatory) for the basin;
3) To identify both the role of stakeholder communities and strategies for facilitating their participation in planning and implementing projects dealing with water management issues in the basin; and
4) To foster participation by facilitating one or more stakeholder forums

As is not uncommon for similar platform or dialogue initiatives elsewhere, a committee called the Steering Committee was formed after some initial groundwork. It was constituted to guide project implementation and was headed by a retired Secretary of the Ministry of Agriculture in the Government of Gujarat. The committee included members from government departments like the Narmada and Water Resource Department, the Gujarat Pollution Control Board, the Ahmedabad Municipal Corporation and the Gujarat Industrial Development Corporation. District development officers (DDOs) of districts falling in the basin, researchers, academics, and training institutes like the Institute of Rural Management, Anand, the Physical Research Laboratory (PRL), Ahmedabad, and the Gujarat Jalseva Training Institute also participated. Leading industrialists were also included as the members of the committee. VIKSAT was given the responsibility for convening the committee.

The following activities were undertaken by the steering committee: conducting field studies surveying literature, the publishing an information brochure, identifying stakeholder sub-groups in the basin, holding meetings of these sub-groups and of the Steering Committee, formation of the Stakeholder Forum, evolving the future agenda through stakeholder meetings, identifying issues concerning stakeholder sub-groups and inviting possible solutions from them, setting future agenda and convening the Forum meetings.

Two Stakeholder Forum meetings were organised and representatives from different stakeholder sub-groups as well as the Steering Committee members attended them. The findings of the water balance modelling carried out under the IDRC-supported project were used as a basis of the discussion in the first meeting, which aimed to finalise the solutions and recommendations suggested by different sub-groups. The second meeting concretised various aspects of the Forum, including its structure, constitution, and role as well as its working strategy for managing the water resources of the basin.

The latest development (2001) was the formation of a Policy Advocacy Cell within the framework of the Stakeholder Forum. This cell was supposed to take up the issues discussed above with concerned agencies in order to reach more democratised and effective solutions. Research in 2004 suggests, however, that the Forum initiative may be stagnating or at best moving ahead very slowly. One issue facing this projects case and other, including one in the Palar Basin in Tamil Nadu which is initiated by NGOs or other civil society actors is how to consolidate and institutionalise after the initial period of enthusiasm and dynamism. The possibilities include state-level policy and bureaucratic reform which allows for more democratic and inclusive policy formulation and implementation as well as the development of a (strong) organisational base in and the mobilisation of the interest groups concerned.[20] The process of consolidation and institutionalisation is illustrated by the second example.

h) The dam-oustees movement in the Krishna Basin

The dam oustees movement in Southwest Maharashtra is an interesting case because it is exemplifies how mass movements and civil society institutions can together rise against the establishment and force it to accept some of their demands. In this case, stakeholders (the dam affected, dam beneficiaries, local units of political parties and civil society institutions like NGOs) came together to discuss, deliberate and take decisions on water related matters. As the movement progressed, various other stakeholders joined the campaign and towards the end even the government joined the dialogue. This example can be read as an illustration of how oppositional politics can be transformed into negotiated development.

The roots of this movement can be traced to Uchangi village in the Aajara taluk of Kolhapur District. The Maharashtra government planned to construct a dam on the small river Tar-Ohal. In order to impound 660 million ft^3 of water, the reservoir would submerge six villages. The beginning of its construction in 1977 met stiff opposition by thousands of men and women of upstream villages who actively opposed the construction of the dam by the State Irrigation Department. As a result, a meeting of the affected villagers, activists of the Shramik Mukti Dal and district-level officials was organised. An agreement was arrived it at the end of the meeting: to consider a scientifically prepared alternative to the above-mentioned dam. This was the first achievement of the movement.

The NGO 'Society for Promoting Participative Eco-system Management (SOPPECOM)' agreed to prepare this alternative plan under the condition that relevant data would be made generally available. A rough plan was prepared using the data released but in the absence of topographical survey data (which the Irrigation Department, citing the Official Secrets Act did not make available), no concrete alternative plan could be prepared. The rough plan and the demand that the whole matter be discussed with the higher authorities in the Maharashtra Krishna Valley Development Corporation (MKVDC) were rejected by the district authorities. A new attempt to start dam construction in June 1998 met with the same fate because of determined and joint opposition from Chaphavade, Jeur and Chitale villages. Ultimately the district authorities did give the villagers some assurances.

Despite its assurances that it would provide the technical data needed to prepare a concrete alternative plan, the Irrigation Department delayed data for 16 months. Authorities also tried to start dam construction once again, but their attempts were foiled and the government was forced to provide the topo-sheet. Despite the inadequacy of the data an outline of the alternative plan was submitted. It proposed building three smaller dams on the Tar-Ohal River which would have the capacity to impound 624 million ft^3 of water, enough to irrigate the area mentioned in the government plan twice over. The alternative plan suggested that 3,000 m^3 of water be given to each family as per the principle of equitable water for sustainable development. Requirements for additional water, it argued, could be met from the local watershed, thereby ensuring no displacements and limited submergence of good quality land.

The alternative plan was partly accepted. Its provision for two small check dams was approved and the engineers of the MKVDC agreed to reduce the height of the Uchangi dam. The Irrigation Department however, rejected the second site. This rejection was once again questioned by the joint front of the Maharashtra State Dam and Project Oustees' Organisation, Shramik Mukti Dal, village representatives and SOPPECOM experts. Although it was indeed possible to reduce the costs of dam construction by introducing a different technology, the officials from MKVDC said they were unable to go beyond government norms and techniques.

Since the modified MKVDC plan to reduce the height of the Uchangi dam was not acceptable to the villagers, the government was forced to agree to build a second dam and to ensure that no house would be submerged due to dam construction. An unprecedented victory was the government's promise to provide lift irrigation facilities to dam-affected villagers at its own cost.

The movement for the equitable distribution of dammed water in South Maharashtra, which started as a dam-protest, is now more than a decade old. It has spread to 13 talukas in Sangli, Satara and Solapur districts. The Shetmajoor Kashtakari Shetakari Sanghatna, (Landless Labourers and Toiling Peasants Organisation) (SKSS) was led by freedom fighter Nagnath Anna Nayakwadi, Bharat Patankar of Shramik Mukti Dal, and Nana Shyetye of the Lal Nishan Party (L). This movement also received support from local organisations like the Hutatma Kisan Ahir Cooperative Sugar Factory. Some local leaders of leftist political parties have supported the movement, but open support from the party high command has been missing so far.

There is more history to tell, but this short extract suffices to illustrate the main points in the context of this paper.[21] Like the one in the Sabarmati Basin described above, this process now operates (after a localised start) at the basin/sub-basin level. The difference is that the initiative has a strong grounding in social movements. The case also shows that the process of achieving more inclusive water resource planning is a long, and perhaps a never-ending, one. However, it is encouraging that government agencies have been induced to engage in the process. Though the negotiations between the movement and the government have not been formally institutionalised, the capacity to form a broad front and to translate protest into a new approach to water resource development in which the government is enrolled is a significant achievement.[22]

Neither the two cases in Sabarmati nor the one in Maharastra are 'model examples' meeting glorification. Both have contradictions, about which those involved seem well aware. I do believe, however, that, in the Indian context, these cases constitute innovative attempts to address water resource management and planning and contain elements that are essential for overcoming the state/village dichotomy. These elements include the 'grounded' nature of the issue at hand (in development speak, the ownership of the problem), the playing out of different aspects of the problem at the different levels, the (long) time frame of social and institutional

transformation, the importance of social organisation and mobilisation, the relevance of an articulated resource and development approach or vision specific to the region, and the vexing issue of consolidating activist energy and achievements into institutional reform.

i) The Panchayat Raj and decentralised planning

To conclude this section of the paper, I briefly comment on the relevance of the Panchayat Raj amendments to the Indian Constitution for the issues discussed in this paper. An argument for the decentralisation of governance and development planning is clearly implicit in the discussion above. In general terms therefore, these amendments could be of great importance in the water resource domain. In canal irrigation, in particular, I believed that a tiered system of decision-making on administrative and development issues is exactly what is required.

Organising decentralised planning and governance along political-administrative lines may, however, create problems for the management of natural resources. Administrative and hydrological boundaries rarely coincide.[23] This raises the issue of whether separate (functional) organisations should be established for water resource management or whether natural resource governance should be brought under the aegis of political-administrative institutions. Proponents of the PRI amendments seem to be rather keen to bring everything under the political administrative umbrella, probably to strengthen the movement. This may not always be very useful for water resource management.[24]

More important in the context of this paper is that the PRI thrust seems to focus mostly on the village and not on intermediate levels of governance and administration. In his recent book on water resource issues, Iyer makes a similar observation while discussing the constitutional arrangements for water management. He observes that when the Constitution was written, governance was defined at the national and state levels, but not further down and that the PRI amendments have added governance at the village level (see Lyer, 2003). This clearly suggests that the state/village dichotomy is not just an idea, a mental construct, but is in fact, consolidated in legal and other institutional arrangements.

Conclusion

To some extent, my general assessment of the prevalence of dichotomous thinking and polarised politics can be countered with a list of examples demonstrating the contrary. The message of this list would be that I was over simplifying reality, that is, there is much more diversity than I suggest. Such examples do exist, no doubt, and they help us to think about innovative approaches. They can also be read as proof of the strength of India's democratic set-up and complement the discussion of the weaknesses I stress in this paper. Nevertheless, the unpleasant fact remains that these initiatives are few and far between and have not translated into a general shift in India's approach to water resource development and management. The technocratic paradigm is still firmly in place, as is the top-down, prescriptive administrative style of governance. This can be seen, for example, in the way watershed development programmes are being implemented by government agencies. Though the notion of water conservation has been adopted, implementation tends to be as technocratic as it was for earlier government programmes.[25] In the canal irrigation sector, even this headway—of implementing new approaches in an old, technocratic way—has generally not been made.[26]

What I intend to argue in this paper is that even the 'alternative paradigm' side of the debate is generally caught in the same quandary as the old paradigm. This proposition is discussed further in the next section.

4. A Critique of Water Resource Management Discourse and Practice

The dichotomies that figure in today's water resources management discourse include modern science vs. local knowledge, modern irrigation vs. traditional irrigation, macro vs. micro, large (-scale) vs. small (-scale), government vs. village, global vs. local, and market dependence vs. subsistence. All are associated with the all-encompassing dichotomy bad vs. good or vice versa.

Dichotomies are not only conceptually inadequate[27] but, in the view of this author, also politically paralysing. They lead to polarised positions that destroy creativity and the possibility of negotiating outcomes. I hope to suggest that there are other avenues that provide more promising, and more realistic, starting points for water resource development. To begin, though, we need to explore the reasons many people remain caught up in dichotomies and polarisations.

This is perhaps easiest to understand for the water resource establishment where huge vested interests, at the institutional as well as the personal level are widespread. Contracts and corruption are part of this equation, but so is the technocratic mindset. There is a whole institutional structure geared, both technically and institutionally, to supply-oriented approaches. India's canal systems are designed technically as supply-oriented systems and management structures are correspondingly centralised. A high-tech orientation has become the professional standard, and there are no incentives for the laborious work of field level engineering. A proud history of engineers becoming statesmen is another factor. The legendary M. Visvesvaraya is a prime example. Many older engineers utter sentences like 'since democracy came, things have become worse' when interviewed on these matters. This dislike of democracy reflects the decreasing status of the engineering profession and political interference in the engineer's day-to-day work. The latter must be acknowledged as a real problem. In addition, many engineers genuinely feel that their professional expertise and achievements are ridiculed by 'environmentalists and sociologists', some of whose alternatives presented seem to them rather unrealistic or outright flawed.

On the NGO/civil society side, the predilection for a bi-polar worldview is not as easy to understand. I, very tentatively, identify the following explanation.

In the 'localocratic' perspective, a translation takes place from a concern for local people who suffer deprivation in various forms, to a strategy that says that action should start and focus at this level. This perspective has a strong Gandhian and 'village republics' current in that village-based subsistence economy is seen as the alternative development paradigm. Even though the extreme form of this view is not often adhered to, it still seems to be present in a lot of thinking and practice. To this author, the view seems to deny of not only ground realities and the existing dynamics of social (urban and rural) transformation but also the legitimate aspirations of people living in villages.

Another influential notion is that if there is to be a sustainable ecological future people will have to make do with the water that is available in their locality. This view suggests that water resource issues can and should be resolved in situ. It works as long as there is enough water to be conserved and local conservation does not affect others outside the locality. However, as is suggested above, trends in agricultural intensification aimed at increasing living standards and population increase are likely, in many cases tend to make this impossible. At the level of principle, this author sees no basic reason why people who happen to live in areas well endowed with water should not share with those who, equally fortuitously live in less well-endowed ones. As a counterpoint to megalomanic water transfer projects, the 'live-with-the-

water-you-have' argument needs to be appreciated[28] reifying it into an absolute principle does not, however, seem very helpful.

It is my distinct feeling that many NGOs active in the water sector would rather have nothing to do with government in terms of trying to shape its functioning but would instead prefer to focus exclusively on their own local projects.[29] Governments are mostly seen as either a constraint or a source of funds, something to lambaste or something to propitiate. The long march through bureaucratic institutions is not popular among development activists, possibly because it can be an extremely frustrating exercise. At the same time, scaling up local initiatives often requires an 'enabling environment' and 'the political will.' Where this support should come from is a question not often seriously asked.

In this respect the establishment of WUAs in canal irrigation systems can serve as an example. Such local efforts will thrive only on a limited scale as long as overall system management and irrigation policies are not reviewed.[30] Because of the intimate physical connection between the micro and the macro in the case of large canal systems, it is perhaps more difficult to find niches for successful local development in such systems than it is in the case of water conservation or forestry-centred initiatives. The nature of the resource and the technology needed to use it thus render the desire to confine oneself to local-level activities a fruitless one.

On the radical left there seems to be a certain unwillingness to or lack of interest in addressing problems associated with the 'developmental state' perspective. The resistance to deregulation and liberalisation (as laid out in anti-privatisation and anti-globalisation critiques) seems to have led to an avoidance of an upfront acknowledgement of the problems which exist in the functioning of state apparatuses. It seems difficult to on the one hand, defend the state as a key actor in the development process and, on the other scathingly criticise bureaucratic functioning. The dominant approach still seems to be to analyse the issue as a matter of bringing the correct (that is the leftist) political party into power, and thereby, automatically getting the state to perform better. Whatever the exact position on and background of the noted unwillingness or lack of interest may be, it directs debate away from struggles within the state and the details of the state's internal structure and modes of interaction with society, and, therefore, away from the issue of bureaucratic reform.[31]

The above discussion identifies three reasons behind the persistence of a bi-polar worldview among proponents of alternative development paradigms.

1) The concept of local, autonomous development is central to the alternative development trajectory;
2) Water resource development and management is assumed to have to 'make out' with the water available in situ;
3) Non-engagement with transformation of existing state apparatuses, for varying reasons.

To be transformed from a simple criticism into a critique, this argument also has to identify the conditions that explain the persistence of this set of perspectives. The material base for dichotomous views and polarised politics is the concrete existence of a highly divided, bi-polar practice of water resource management, as noted in the discussion of the findings of the inventory of multi-stakeholder platforms above. As noted, the state/village dichotomy is enshrined in the Constitution in the sense that intermediate levels of governance are poorly if at all defined. This is not a 'design error,' but a situation rooted in the long and complex history of

both the state and the village sides of the relationship, as well as a structural characteristic of India's political democracy (see Kaviraj, 1997).

Two elements I extract from Kaviraj's analysis are firstly the 'imposed' (but irreversible) character of parliamentary democracy, leading to an 'external' relation between the state and local communities and social groupings in general; and, secondly, the role of caste in the reproduction of this relation. The Western form of political democracy that India adopted after independence was an elite project implanted on Indian society 'from the top' and not a system whose design emerged out of local struggles. The political and administrative institutions of the state have, as a result, in some respects been treated by people in the same way as they treated the colonial and pre-modern states. Touting redistributive rhetoric post-independence emancipation and economic development allowed new groups, to access state resources. In this structure, with the state exterior to local social dynamics, the state is seen as a whimsical tyrant with which one enters into relations of patronage but never considers as one's own. It is seen as an entity whose behaviour one tries to control or influence for one's own benefit. As Kaviraj eloquently shows this attitude can trace its historical roots to the way the pre-modern and colonial states operated. Moreover, independent India decided to adopt the British system of colonial administration. In the, period of political instability after independence, the new leadership found that a 'strong state' needed to be established.

Regarding caste, Kaviraj, about pre-modern states in India, argues the following position.

> "[p]ower at the level of the village community tended to be exercised through the paradoxical logic of the caste system. Its specific manner of allocating productive functions and rewards maintained a system of social repression without making specific individuals the agents of these relationships of disdain and resentment. The global human world, its essential principles of ordering, were not subject to individual or collective construction. (...) The political implication of this feature of caste society is important. Under this arrangement, it is impossible for the state to aspire to become the site of universality and sovereignty; the state could not claim a Durkheimian majesty by becoming the symbol of society as a whole, and a preserver of its form and continuity. That was lodged in a self-maintaining moral; order to which the state was normally subordinated. (...) [The state's] primary function was to police possible infringements, not to make rules affecting the fundamental order of social relations. (...) Thus, the precolonial type of political authority seems strikingly devoid of two features that social struggles of European modernity imparted to the modern state. It was not an authority for appeal against widespread structural injustice, oppressions, iniquities, irrationalities of social processes. (...) To apply the state/civil society distinction to traditional India therefore would be to invite a serious conceptual misunderstanding." (Ibid)

There is now a civil society in India, and a very active one as demonstrated above, so there a simple argument of continuity will not hold. However, the (central) state-village dichotomy still seems to be very much part of the Indian polity, and the state has not achieved the dissolution of caste-based relations of domination, even though it has tried. The existence of a strong caste-hierarchy as a general organising principle implies the lack of vertical solidarities, and thus predisposes discourse and practice to bipolar forms.

A mechanism which operates at the day-to-day level of the practical mechanics of polarisation is as follows. It is often strategically convenient to phrase issues and approaches in bi-polar terms (and inconvenient to emphasise complexity and diversity). To engage with the system, one cannot ask fundamental questions and look for nuances all the time. Some closure and simplification is necessary for effective strategic action. These strategic counterpoints however, tend to solidify into paradigmatic categories which are seemingly confirmed by day-to-day experience where government administration is not accountable and where politics focuses on gaining concessions from the state for and by social groups, often caste-based.

The Indian paradox of the existence of an institutional gap between 'government' and 'village' in an overall democratic set-up can perhaps be resolved in the following manner. Since

Independence, through the gradual emancipation of the so-called lower castes and classes the principle of hierarchy has increasingly been questioned. This process has required, and still requires, a lot of confrontational politics to advance. This struggle has primarily focussed, as far as the institutions for resource management are concerned, on access to existing (state) apparatuses and programmes rather than on questioning the apparatuses and programme themselves.

The adoption of the 73rd constitutional amendment in 1993 to strengthen the Panchayat Raj system perhaps signifies that it is now possible to reconsider the characteristics of some of these (state) apparatuses and programmes. Through this amendment, decision-making has been both democratised and decentralised and now can become more inclusive. This is thus a focus on the process dimension of, in the context of this paper, resource management. It implies a shift from a focus on equity to an enlarged scope that also looks at the institutional mechanisms through which equity and other aspects of development can be negotiated by the interest groups concerned. The PRI effort may, however, reproduce the same village-state dichotomy through its strong focus on village institutions and their legitimisation by state governments. Moreover, the type of decision-making possible in PRI institutions may not be appropriate for adequate natural resource governance and management and may not be able to deal effectively with the issues at different levels. In short, the PRI framework doesn't take the issue of institutional reform far enough. The discourse and practice of institutional reform in the water resource sector, as elsewhere, is still caught in the state-village dichotomy.

5. Implications for Research and Praxis

The implications of the argument above for water resource research and praxis are discussed below.

Regarding research on institutions for water resource management, more attention should be given to the study of these institutions at different levels. In addition to examining negotiated development at the local level, efforts to investigate the establishment and functioning of institutions at higher levels is important. Advocacy and research on the problems of the Tribunals and on alternatives to that framework is also relevant. More generally, research and advocacy on how water users and organisations representing them can participate in water resource policy formulation rather than only implementation is another topic of academic as well as practical interest.[32]

On the front of science and technology, there is a strong need for what I would call 'creative engineering' or 'innovative knowledge generation and management,' that is, the (re-) invention of a water science that directly engages with real world water problems in a comprehensive manner. This would have to be done through the collaboration of water professionals, in 'conventional' disciplines, water users, and academic or other facilitators that know the ropes of interdisciplinary research and development practice. Such participatory approaches have already been developed in sectors other than the water sector; canal irrigation however, is the most barren terrain.

In the field of development practice, I would call for larger-scale experiments with the more comprehensive alternative paradigms that were discussed above by supporting existing local and regional initiatives.

For all these desirable actions both the emerging international bandwagon and the container concept of integrated water resource management (IWRM) may prove to be useful.[33]

These developments may provide policy and discursive space to advocate, strengthen and initiate new approaches in research, capacity building and praxis. But buying into this global process implies, for some, committing the adulterous act of sleeping with the enemy. Luckily, people, and not metaphors, manage water.

Notes

1 Perhaps illustrative of this lack of debate is that in the Social Ecology collection edited by R. Guha (1998), the paper selected on this topic written by Whitcombe refers to the situation in the 19th century. In recent times scores of activist writings have highlighted the ills brought by large-scale water logging in the command of North-Ganga plain, but they are not part of the larger debate. See Gyawali (1998) for analysis.

2 For example, the analysis of 'the system of political and administrative corruption' initiated by Robert Wade (see Wade 1982) has not been taken forward. The equity issue that was prevalent in policy debates on canal irrigation in the 1970s and 1980s has attracted little attention from scholars in the past decade. The discussion and practice of establishing WUAs has not been developed into a debate on democracy in local resource management. The general point here is that social science analysis of canal irrigation has never really taken off in India. A predilection for the local and the village exists in social science scholarship. Most critical scholarship has focused on local, farmer-managed irrigation and other local forms of water resource management. For example, the historical literature on canal irrigation is a fraction of what is found on tank irrigation. Apart from the feel-good factor in studying local processes, social science seems to fear studying large technical systems, because such studies supposedly require a lot of technical expertise. In addition, a strong tradition of studying state practices, that is, social anthropological investigations of the politics of policy formulation and implementation is lacking.

3 Other factors beyond the scope of this paper also play a role in explaining the defensiveness of the water bureaucracy, particularly those relating to 1) the budgetary crisis many state governments face which exerts pressure on irrigation department budgets and 2) performance and management problems within systems. At the level of discourse and perspective, however, the debate about large dams has strongly shaped the attitudes of the engineering establishment. This has led to aggressive organised lobbying for the pro-dam stance.

4 It is probably correct to say that the environmentalist perspective has triggered innovation in the water sector in many places in the world, not just in India. For example, in the Netherlands, the transformation of water boards from farmer controlled and agriculture oriented organisations into multi-stakeholder bodies dealing with water in a more comprehensive manner was mainly triggered by environmental criticisms of agricultural water use. For how the USBR (United States Bureau of Reclamation, the American irrigation and dam agency) internalised environmental concerns, see Espeland (1997). Its approach is also briefly discussed below.

5 See, for example, Nadkarni (1984), Dhawan (1988) and Chambers (1994).

6 See Shashidaran (2000) on this issue. The reasons he identifies for the lack of NGO interest in canal irrigation are fear that irrigation will further increase the divide between the haves and the have-nots, that it will lead to unsuitable agricultural practices and is inherently environmentally unsound, that it is 'high tech' and beyond the scope of NGOs/CSOs, and that NGOs/CSOs do not relish the prospect of having to interface with government departments.

7 It can be argued though, that in many areas the combination of canal irrigation and private tube well irrigation has been the core trigger of agricultural intensification since the introduction of the Green Revolution crop varieties and related inputs. Private (tube) well irrigation has expanded explosively (see Dhawan, 1982) within and outside canal irrigation command areas.

8 As with water logging and salinity, it is hard to find reliable statistics, but case study evidence suggests that the areas involved are substantial. The Development Support Centre, Ahmedabad, and Wageningen University started a research project in October 2001 on 'tail enders and other deprived' farmers in different types of irrigation systems across India that is intended to provide a slightly better approximation of the magnitude of the problem. The report, which was published in 2003, shows very substantial areas of deprivation in canal irrigation (see planningcommission.nic.in/ reports/sereport/ser/std_prbirrg.pdf for the final report of the study; also see Rajagopal et al., 2002))

9 For a discussion of the village-state dichotomy in natural resource management analysis and practice (particularly forestry/joint forest management) that also refers to the 'small is beautiful' trajectory of natural resource management activism and research, see Lele (2003)

10 One effect of the large dam controversy (and other factors) is more attention on land and water management in rain-fed regions in general and in rainwater harvesting in particular (see the Introduction in Agarwal and Narain, 1997, where this connection is stated). This is very welcome and long due, but separate programmes for such issues tend to reproduce the dichotomy discussed (even when the strengths of the dichotomy's poles may have become less unbalanced).

11 This is not to subscribe uncritically to the 'ecological modernisation' paradigm, but simply to show that environmental concerns have been internalised to some extent. Arguably, in general, state bureaucracies are less prone to generate processes of reform through 'social learning' than some parts of the corporate sector given the incentives and structural features in/of the two domains. I do suggest, however, that the Indian situation with regard to water resources reform is not adequately explained by general 'bureaucratic inertia' arguments.

12 The institutions could be 'formal' or 'informal', that is, not many restrictions on what they should look like to qualify as a multi-stakeholder platform were put. The objective of the inventory was exactly to find out what form such institutions do take in practice.

13 A point not explored extensively in this paper is that there may be strong political and historical roots to this state-village dichotomy. On this see Kaviraj (1997) Gandhian thought is also important in this context.

14 Consider the following 'only way' construct in the Executive Summary of Agarwal and Narain (1999:2). I have no problem in agreeing to a large extent with the substantive part of the account, but the strategic inference in the last paragraph is, in my view, highly debatable.

> "[The] tradition of [rainwater harvesting], and the knowledge and management systems which accompanied it, has been undermined by two recent changes, largely brought about by colonial attitudes to water management and administration:

1) The state has become the major provider of water, replacing communities and households as the primary units for provision and management of water.

2) There has been increasing emphasis on the use of surface and groundwater, while the earlier reliance on rainwater and floodwater has declined, even though rainwater and floodwater are available in much greater abundance.

However, a number of recent initiatives, both community and government driven, demonstrate that reviving rainwater harvesting systems can dramatically restore ecosystems and contribute to rural development. But the success of these cases does not just depend on the development of rainwater harvesting structures; the entire exercise must be underpinned by community-based decision-making systems and institutions, and enabling legal and financial measures which promote community action.

The only way this objective can be achieved is by deepening systems of participatory democracy and expanding people's participation at the village-level as much as possible. Every settlement must have a clearly and legally defined environment to protect, care for and use, and an open forum in which all can get together to discuss their problems and find common solutions. By strengthening and emphasising the importance of open forums, common solutions and common natural resources, the developing world can make a determined bid to revive the dying community spirit and to rebuild its devastated environment." [my emphasis, PPM]

15 In all fairness it must be said that NGOs do recognise the problem to some extent. For example the problems related to the sinking of tube wells in tank commands areas is a well acknowledged issue, and there is a discussion on the conversion of irrigation tanks to percolation tanks. Venkateshwarlu and Srinivas (2001) report that in Andhra Pradesh in several instances tank users have restricted command area farmers from pumping bore well water to non-command areas. However, this does not address the problem fully, as tanks also recharge groundwater outside the command areas, and to avoid over-extraction this pumping would also have to be regulated. This takes the issue from the tank level to the supra-tank level. The referred report does not discuss this. The tank remains the unit of analysis. I am not suggesting that there care no individuals with this insight. The point is that the issue is not part of the policy and public discourse.

16 For a discussion of Tribunals and the Cauvery issue, see for example Iyer (2003).

17 This is not the place to go into questions like how these colonial traditions made or not made use of existing available irrigation knowledge. Local knowledge was both incorporated and suppressed, though this is rather poorly documented. One aspect of this is that Indian/sub-continental irrigation knowledge seems to have been much less codified than for example Chinese irrigation knowledge. It seems to have existed primarily in the form of skilled labour power. The regional imperial traditions also made contributions to general hydrological and engineering science. The early decades of the 20th century were a period of rapid development of these disciplines.

18 See Nanda (1991) for a critique of criticisms of green revolution technologies.

19 This section and the next are extracted from a draft report by Rajput (2001) The Maharashtra case description within this is mainly based on Phadke (2000).

20 The case will be analysed in more detail in the PhD thesis of Sriprakashsingh Rajput, whose initial report was used for this discussion (see previous footnote).

21 Regarding more detailed analysis, the same applies to this case as mentioned in the previous footnote.

22 On the concept of 'regenerative agriculture' underlying some of the conceptual thinking in the initiative, see Paranjape and Joy (1995) and Datye (1997).

23 The issue of boundaries is more complex than a mismatch between administrative and hydrological boundaries, and doesn't exhaust the problematic of institutional integration or coordination, but detailed discussion is outside the scope of this paper. Moss, in the European context, classifies the issues involved as those of fit, scale and interplay (Moss, 2003).

24 Irrigated farmers in Andhra Pradesh have in 2004 protested against plans of the new Congress government in that state to bring WUAs under the PRI, and they seem to have been successful (personal communication R. Doraiswamy of Jalaspandana).

25 Another example of how firmly the 'old paradigm' is still in place, is the surge of the Interlinking of Rivers idea after the Supreme Court order about this.

26 Some qualification is necessary here. Efforts by governments at the introduction of farmers' participation through Water Users Associations have generally been top-down (in contrast to some NGO initiatives). More importantly, they have been very piecemeal. The introduction by the government of Participatory Irrigation Management in Andhra Pradesh, since 1996-97, on a very large-scale seemed to signal a new phase in irrigation reform. However, it has not taken on board ideas on integrated water resources management, ecological sustainability and water rights for example. It is very much a product of the 'irrigation management' perspective on irrigation. It does introduce tiered decision-making with user involvement, at minor, distributary and project level. The Project Committees are yet to be established, however, which reinforces the argument of this paper.

27 For almost any topic and discipline critiques of dichotomous conceptions are available. For a general discussion of dichotomies in social science analysis see Krieken (2002).

28 Regarding excess water in flood prone areas there is a similar 'living with floods' argument. See Ahmed (1999).

29 For example, there are no examples known to me of NGOs/CSOs specifically focusing on accountability, participatory budgeting or right to information issues, at least in rural water management, and certainly not in canal irrigation. Such concepts seem to be more promoted in urban areas and other sectors.

30 As the cases of Maharashtra and Gujarat illustrate. When Andhra Pradesh government officials designed their irrigation reform policy in 1996-97, they deliberated that if they would go by the NGO approach to irrigation reform they would never get there, and settled on a State–wide introduction by means of an Act.

31 Put differently, my suggestion is that radical leftist approaches focus on the classical Marxist concerns of state power, class domination and imperialism while discussing the state (and designing political strategy), and are less interested in the details of its internal organisation and state projects and practices. This phrasing is taken from Jessop (1990: chapter 12). In Indian social science this has led to a relative lack of critical research on the internal dynamics of the state and government bureaucracy, including the analysis of policy processes (see Mollinga (2004) for more discussion of this point). Movements for electoral reform and right to information campaigns are counter examples, but they are not very prevalent in water resources activism specifically.

32 In the context of canal irrigation management this could be phrased as the need to move on from participatory irrigation management to participatory irrigation governance. The non-establishment of the Project Committees in the Andhra Pradesh irrigation reform scenario would from this perspective be analysed as its main failure: it is exactly where governance

power is located, for instance in the allocation of and rule making for water (management) and allocation of and rule making for physical works (execution).

33 The main global social carrier of the IWRM concept in past years has been the Global Water Partnership, based in Stockholm. The concept is increasingly incorporated in water resources policies worldwide, including India's National Water Policy.

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